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Prioritätsbescheinigung über die Einreichung einer Gebrauchsmusteranmeldung

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Bezeichnung: Vehicle having a roof assembly; and such roof assembly

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Die angehefteten Stücke sind eine richtige und genaue Wiedergabe der ursprünglichen Unterlagen dieser Gebrauchsmusteranmeldung.

München, den 19. März 2003
Deutsches Patent- und Markenamt
Der Präsident
im Auftrag

Wallner

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Vehicle having a roof assembly; and such roof assembly

The present invention relates to a vehicle according to the preamble of the claim 1.

Such vehicle is known in various embodiments. The known roof assemblies include rigid panels or foldable covers adapted to move in different fashion.

The object of the present invention is to provide a vehicle having extended possibilities of opening the roof.

For this purpose, the vehicle has the features according to the characterising portion of claim 1.

Due to the invention it is possible to open the roof of the vehicle to a very large extent by moving the at least one closure element and the rear cross beam away into the trunk of the vehicle.

In an advantageous embodiment the unit is positioned at the bottom of the trunk when in its inoperative position, and preferably the trunk comprises a bottom hatch below which the unit is positioned upside down when in its inoperative position.

Due to these features, the movement of the unit can be quite simple, i.e. substantially a rotating movement, while the trunk can still be used when the unit is in its inoperative position.

To obtain a simple movement of the unit by means of the pivotable arms, the vehicle may have a rear window which can be opened for enabling the pivoting movement of the unit to provide even more room for the rotating movement of the unit. It is preferred that the vehicle has a trunk lid to which the rear window is slidably attached, whereas the trunk lid is movably connected to the body on its lower side. This enables the trunk lid and the rear window to move out of the way and enable a wide swing of the unit.

An advantageous embodiment of the vehicle according to the invention is characterised in that the roof assembly includes at least two, and preferable at least three slidable closure elements, preferably rigid panels, lying one behind the other in the closed position of the roof assembly and lying substantially one above the other in the open position. Such

multi-element, in particular multi-panel roof offers many choices in opening the roof, so that the roof can be adapted to all kinds of situations or circumstances.

The invention will now be further elucidated with reference to the drawings, showing an embodiment of the vehicle according to the invention.

Fig. 1 is a very schematic longitudinal vertical section of a part of the vehicle according to the invention, wherein the roof assembly is in its closed position.

Fig. 2 shows the vehicle of Fig. 1, but with the roof assembly in its open position.

Fig. 3 shows, on a larger scale, detail III in Fig. 2.

Fig. 4 is a view corresponding to that of Fig. 3, but with the rear window opened.

Fig. 5 is a view substantially corresponding to that of Fig. 4 and illustrating the movement of the unit comprising the closure elements and the rear cross beam of the vehicle roof.

The drawings, and in particular Fig. 1 thereof shows an embodiment of a vehicle, in this case consisting of a passenger car, in particular MPV car. The vehicle includes a body 1 enclosing a passenger compartment 2 and a trunk 3. The body 1 has a roof including a roof assembly 4 to be described hereafter in more detail. The trunk 3 can be opened by means of a trunk lid 5. The lid 5 is connected to the body 1 of the vehicle by means of pivots 6 which are located on the lower side of the trunk lid 5 when in its closed position, so that the trunk lid 5 will move away from the vehicle at its upper side and will present a projecting floor when in its oper position. The trunk lid 5 includes a rear window 7 which is slidably attached to the trunk lid such that the rear window 7 will sink away into the trunk lid 5 when it is opened.

The roof assembly for the vehicle comprises in this case three movable closure elements 8, 9, 10 consisting of rigid, preferably at least partly transparent panels. The closure elements 8 are slidably guided in longitudinal guide tracks extending along an opening 17 in the roof and along longitudinal roof beams of the vehicle (not shown). Operating mechanisms will cause the opening and closing movements of the closure elements 8 - 10 in a manner known from the prior ar .

As is shown in Fig. 1 and 2, the movable closure elements 8 - 10 can be moved from a closed position lying one behind the other to close the roof opening 13, to a stacked position, lying one above the other below a fixed panel closure element 11 which is positioned in front of a rear cross beam 12 of the vehicle roof. The movement of the closure elements 8 - 10 can be obtained in a manner known per se. For example, it is possible to guide each of the closure elements 8 - 10 in its own guide track, and it is also conceivable to guide the closure elements through a common guide track to its own stacked position below the fixed panel 11.

As is further shown in Fig. 2, the rear cross beam 12 is attached to the upper end of an arm 14. In fact there are provided two arms 14 on each side of the vehicle and each fixed to a lateral end of the rear cross beam 12. One arm 14 is shown in a very simplified manner as a single piece arm 14 having a fixed pivot 14, but in a practical embodiment the arms 14 may include several parts which may move relatively to each other and which may pivot with respect to a virtual pivot or may perform a combined translating and rotating movement.

Fig. 3 shows the rear portion of the vehicle on a larger scale the closure elements 8 - 10 are shown in their opened position in which they form a unit with the rear cross beam 12 such that when the rear cross beam 12 is moved by means of the arms 14, the closure elements 8 - 11 will move along. One possible embodiment is that the guide tracks for the closure elements 8 - 10 are fixed to the rear cross beam 12 and panel 11 to hold the closure elements 8 - 10 together during the unitary movements thereof.

In Fig. 4 it is shown that the rear window 7 is slid to its open position within the trunk lid 5 in order to make room for the rear cross beam 12 to move downwardly and rearwardly. In Fig. 5 it is illustrated that the trunk lid 5 together with the rear window 7 are moved to the open position to completely free the path of the unit 15 in order to move from the operative position at the vehicle roof to an inoperative position at the bottom of the trunk 3. In Fig. 5 it is illustrated by three different positions that the arms 14 perform a purely pivoting movement around the pivot 14 but it will be understood that,

especially in a first part of the movement from the operative position, the unit might have to make a slight lifting movement in order to release the parts from their respective seals.

In the inoperative position, the unit 15 is lying upside down at the bottom of the trunk 3 and may be covered by a movable bottom hatch 16 acting as the trunk floor when the unit 15 is in the in operable position so that the trunk may still be used for luggage. When the trunk hatch 5 is closed again, the vehicle is ready again for use. The vehicle is then more or less a convertible car of which the roof is opened completely. In order to close the roof again, the sequence of movements is performed in reverse order.

From the foregoing description it will be clear that the invention provides a vehicle and a roof assembly which has outstanding operating possibilities, a flush exterior design and an advantageous manner of stacking movable closure elements below the fixed panel and hiding the unit in the trunk of the vehicle. With the proper design and operating equipment the roof assembly does not require tools or large muscular force to move the unit between the operative and inoperative positions.

The invention is not restricted to the embodiment shown in the drawing and described therein before and may be varied in different manner within the scope of the appended claims. For example, it is possible that the closure element consists of slats or a folding cover, and may also be moved above a fixed roof part in the open position of the roof assembly.

CLAIMS

1. A vehicle having a body (1) including at least a trunk (3) and a roof, and having a roof assembly (4) for opening an opening (17) in said roof which includes at least a rear cross beam (12), said roof assembly comprising at least one closure element (8, 9, 10) which is at least movable between a closed position for closing the roof opening, and an open, rearwardly displaced position, in which the roof opening is at least partially released, characterised in that the rear cross beam (12) is connected to pivotable arms (13) which are at least pivotally attached to the body (1), said at least one closure element (8, 9, 10), when in the open position, forming a unit (15) with said rear cross beam (12), the unit (15) being pivotable by means of said arms (13) between an operative position at the roof and an inoperative position in the trunk (3) of the vehicle.

2. A vehicle according to claim 1, wherein the unit (15) is positioned at the bottom of the trunk (3) when in its inoperative position.

3. A vehicle according to claim 2, wherein the trunk (3) comprises a bottom hatch (16) below which the unit (15) is positioned upside down in its inoperative position.

4. A vehicle according to any of the preceding claims 1, wherein the vehicle has a rear window (7) which can be opened for enabling the pivoting movement of the unit (15).

5. A vehicle according to claim 4, wherein the vehicle has a trunk lid (5) to which the rear window (7) is slidably attached, said trunk lid (5) being movably connected to the body (1) on its lower side.

6. A vehicle according to any of the preceding claims, wherein the roof assembly (4) includes at least two, and preferably at least three slidable closure elements (8, 9, 10), preferably rigid panels, lying one behind the other in the closed position of the roof assembly (4) and lying substantially one above the other in the open position.

7. A vehicle according to claim 6, wherein the roof assembly (4) includes a rear fixed panel (11) below which the closure elements (8, 9, 10) are positioned in the open position

of the roof assembly.

8. A vehicle according to any of the preceding claims, wherein the roof assembly comprises at least one longitudinal guide track extending at least along a side beam of the vehicle roof and along the roof opening (17), and said at least one closure element (8, 9, 10) being guided by said longitudinal guide track.

9. A vehicle according to any of the preceding claims, wherein the rear cross beam (12), when in its operative position, is sealed with respect to side beams of the roof by means of seals, said pivotable arms (13) being provided with a mechanism to lift the rear cross beam (12) from its seals before or when it is moved to its inoperative position.

10. A roof assembly for use in the vehicle according to one of the preceding claims.

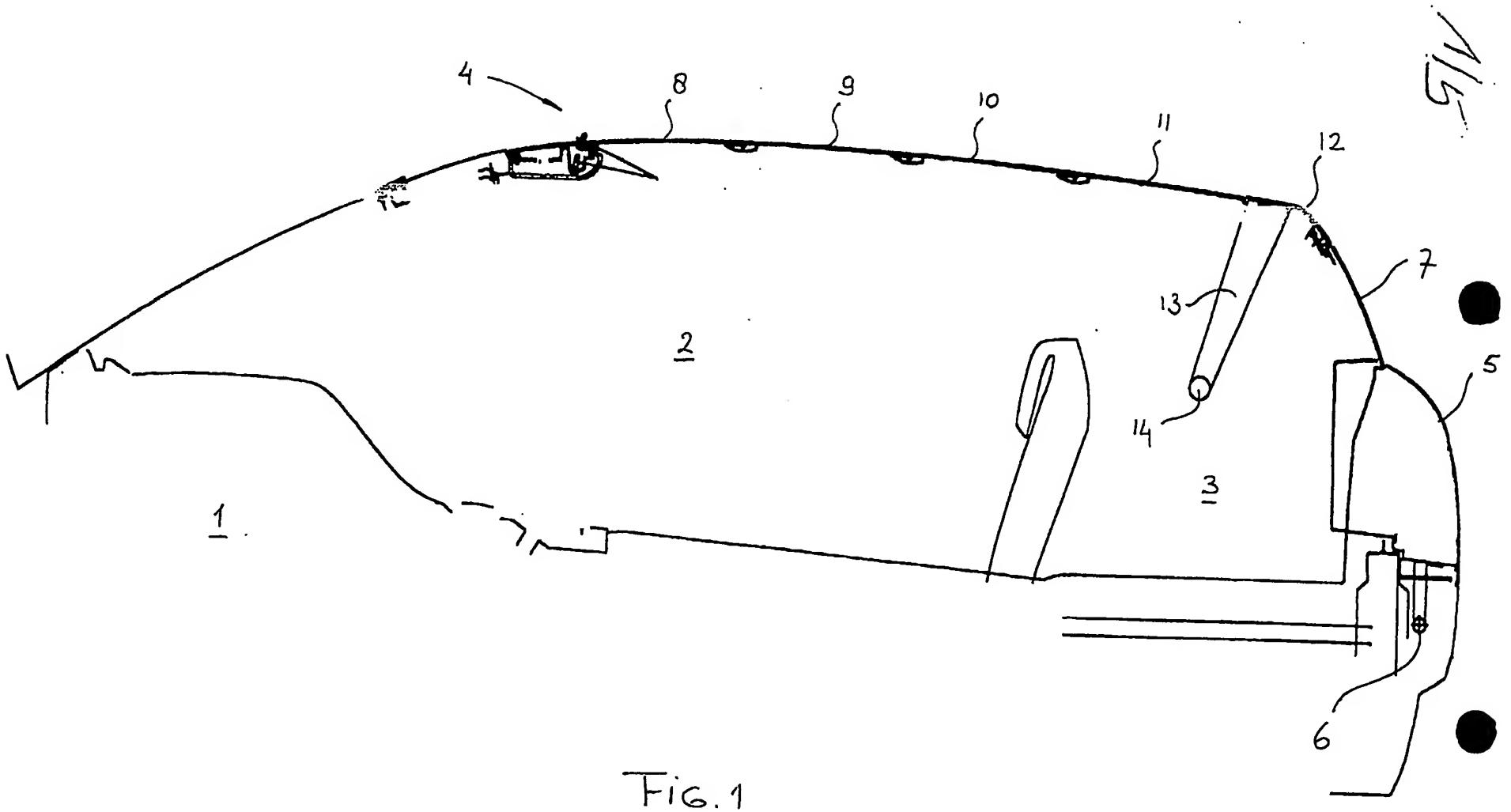

FIG. 1

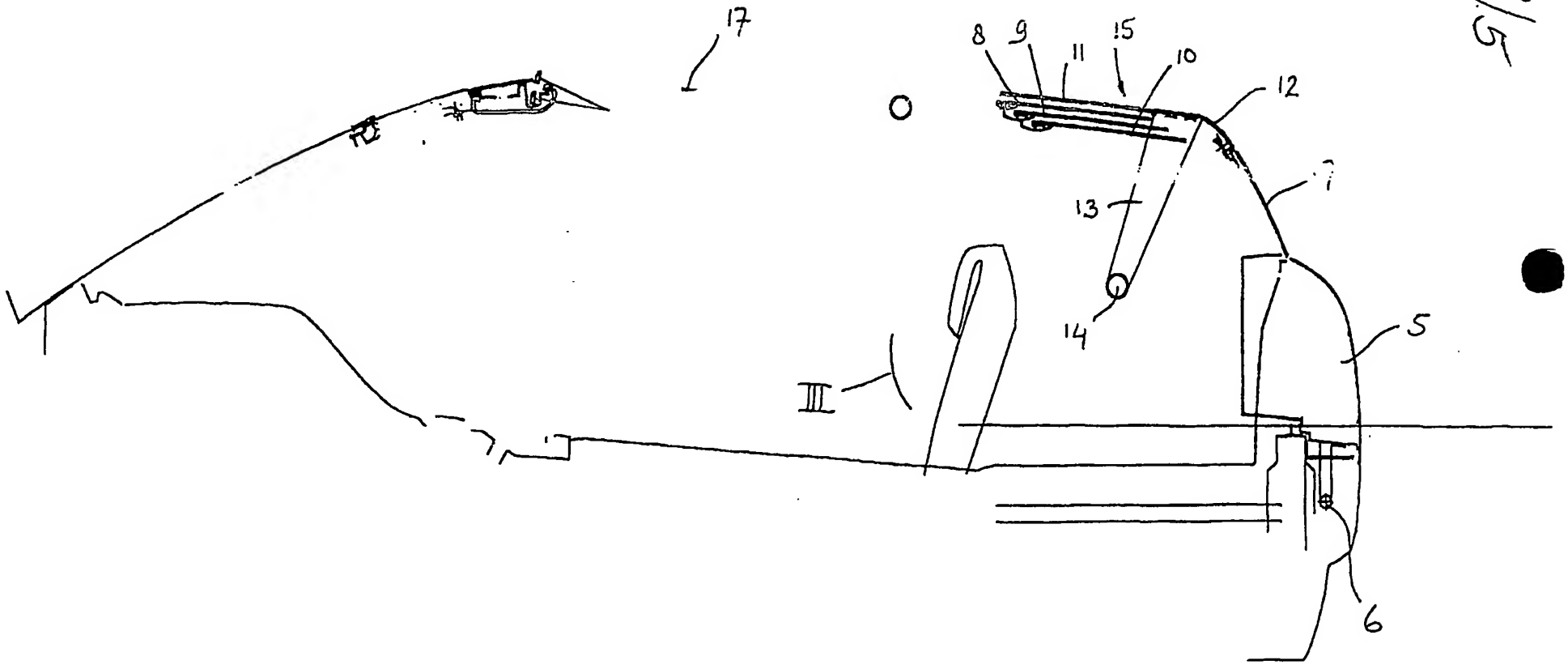

Fig. 2

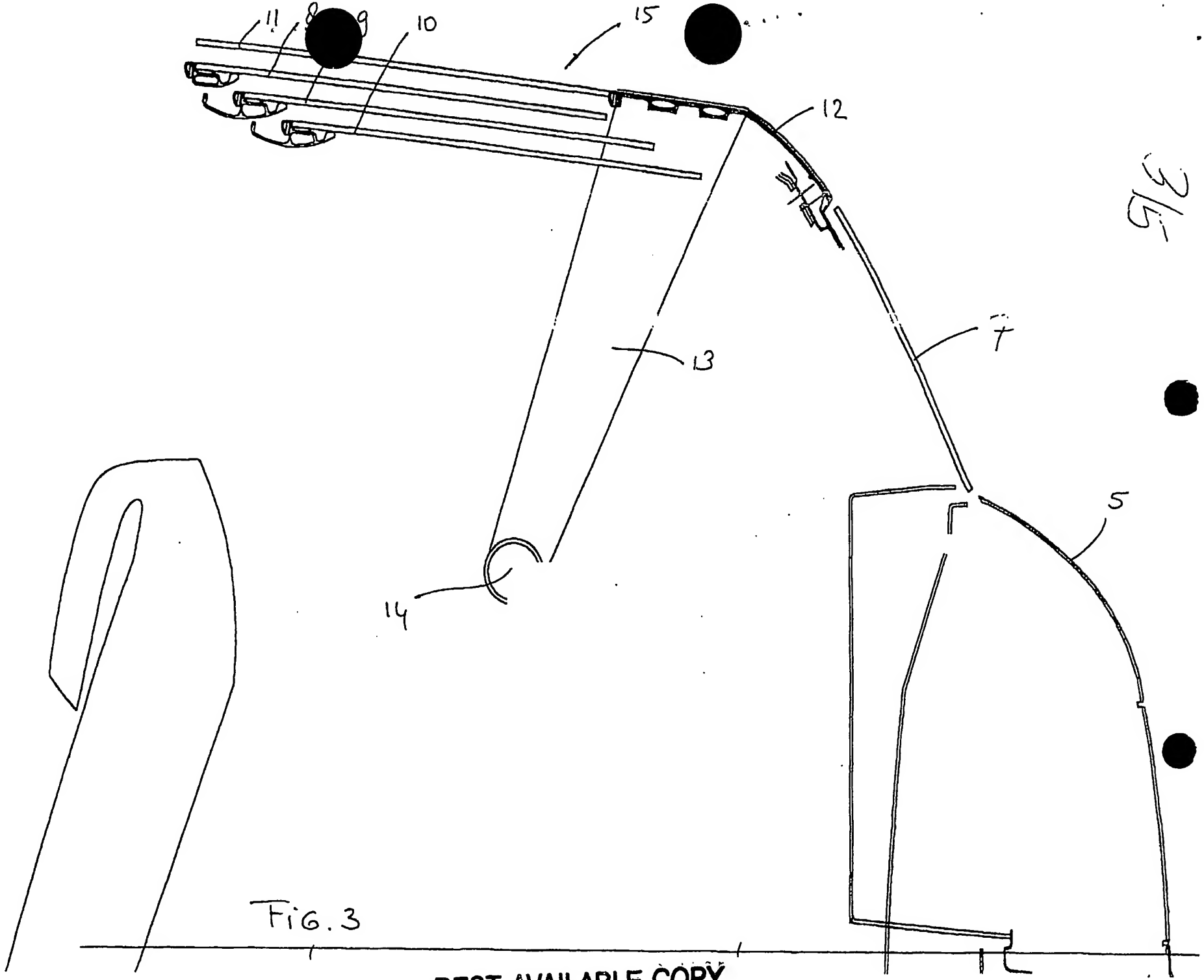

Fig. 3

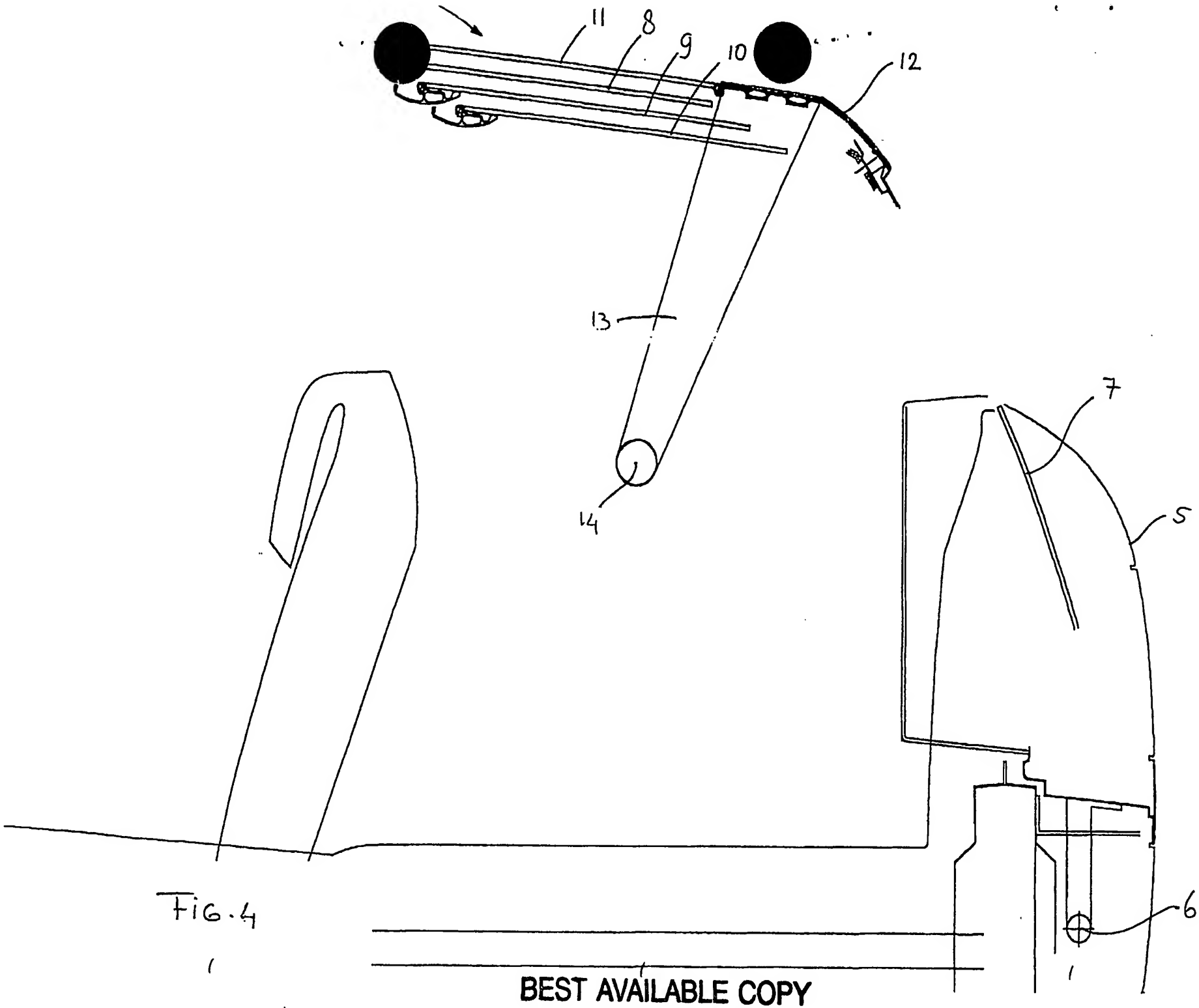

Fig. 4

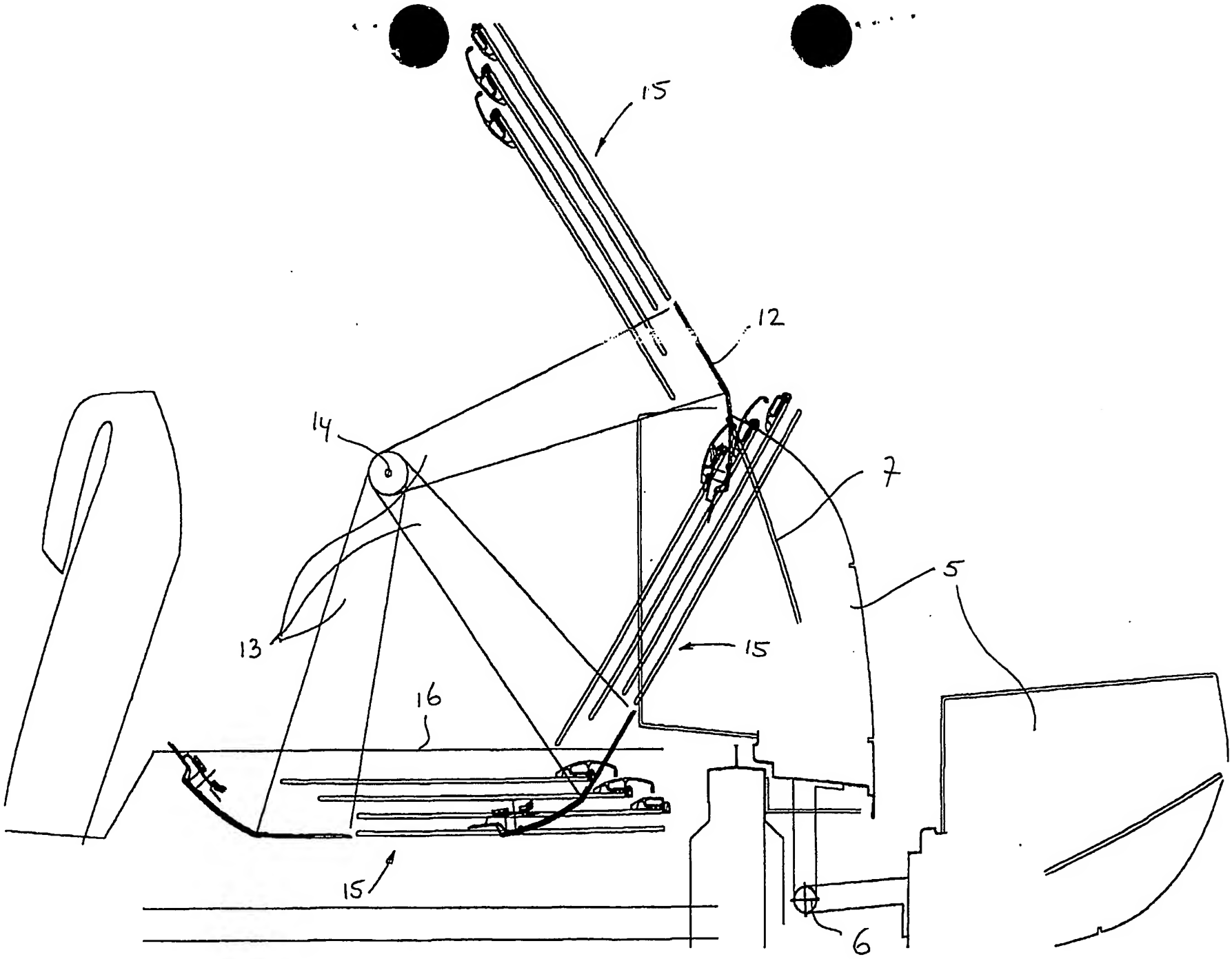

Fig. 5